Quarterly Progress Report

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(April 27, 2013)

Grantee:	University of Alaska Fairbanks/Office of Sponsored Programs
Performing Org.:	Alaska Hydrokinetic Energy Research Center (AHERC)
Project Name:	Eagle Hydrokinetic Project - Eagle Hydro - INE - Debris - Anchoring
Grant #:	01198-00 -UAF G6078 (Alaska Power and Telephone (AP&T) Denali Commission award).
Period of Report:	January 2013, through March 2013.

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Introduction

The debris mitigation project goals are to:

(1) Develop a test debris mitigation platform that will allow us to test various debris mitigation technologies and methods. (completed)
(2) Prepare the Nenana test site infrastructure (e.g., anchoring/mooring system) to be able to accommodate the debris mitigation platform tests (completed) and possibly retest the New Energy Turbine, as appropriate (Cost estimates to refurbish the New Energy Turbine and our work on debris testing indicates that it is beyond the scope of this project).
(3) Obtain necessary permits and conduct the necessary baseline studies to prepare for the debris mitigation testing. (completed)
(4) Conduct the debris mitigation technology and debris management methods testing (completed).

Note: With all major tasks of the project completed we are now analyzing data with the intention of completing project reports and providing recommendations on debris mitigation technology and methods.

Refer to previous quarterly reports for a general description of the project and activities to-date. Previous quarterly reports were submitted on 10/15/2011, 1/16/2012, 4/3/2012, 7/24/2012, 10/18/2012, and 1/15/2012.

Activities and Progress

During January through March we began analyzing current flow data behind the Research Debris Diversion Platform (RDDP). Initial velocity plots downstream from the RDDP were done and reported at the AHERC advisory meeting in Anchorage. Preliminary velocity and force plots at selected locations (transects) downstream the RDDP were done. The RDDP and locations where 3 dimensional current velocities were measured using an acoustic Doppler current profiler are shown in Figure 1a and the boat

used for making the current velocity measurements is shown in Figure 1b. The velocity magnitude at the different measurement points is shown in Figure 2a and the vector components North and East are shown in Figures 2b and c. The figures indicate that the overall current velocity magnitude is lower at each depth as the distance between the measurement location and the RDDP increases (Figure 2a). This may be caused by turbulence generated as the river flow is diverted around the RDDP. Evidence for a turbulence based explanation for the velocity decrease is that the magnitudes of the vector current velocity directions change with measurement location distance from the RDDP (Figures 2 b and c.)

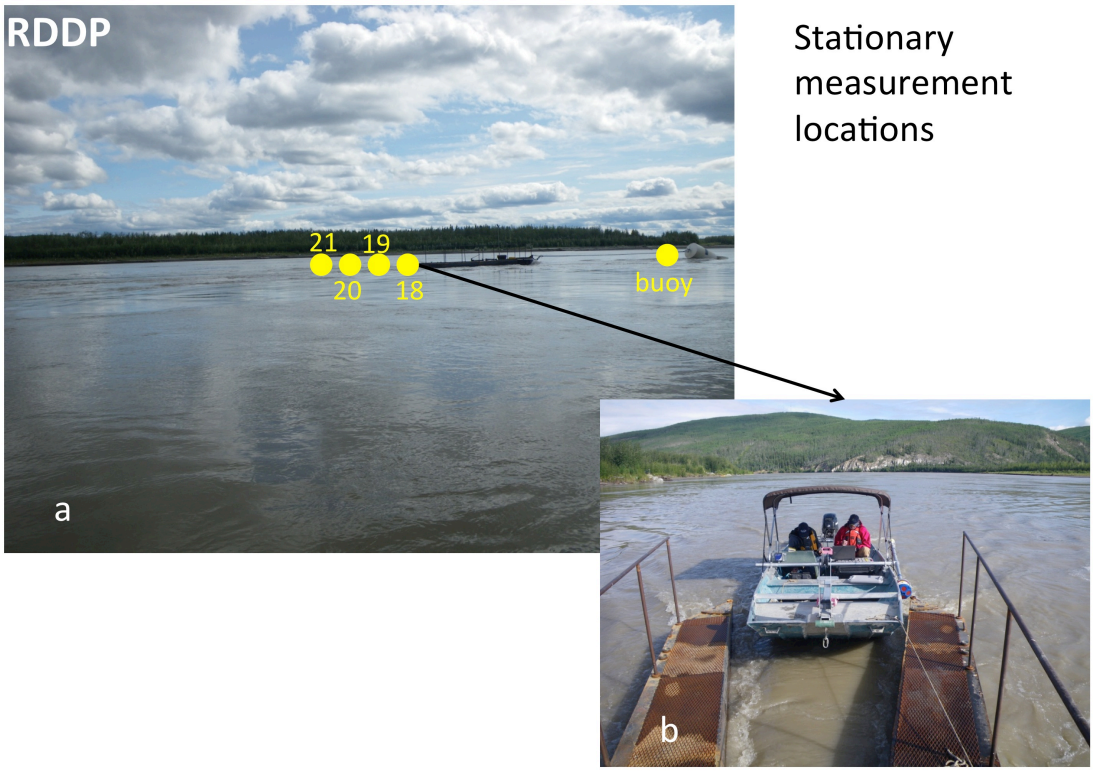

Figure 1. Acoustic Doppler current profiler measurement location with respect to the RDDP and mooring buoy (a) and the boat used to make the measurements tied to the rear of the RDDP (b).

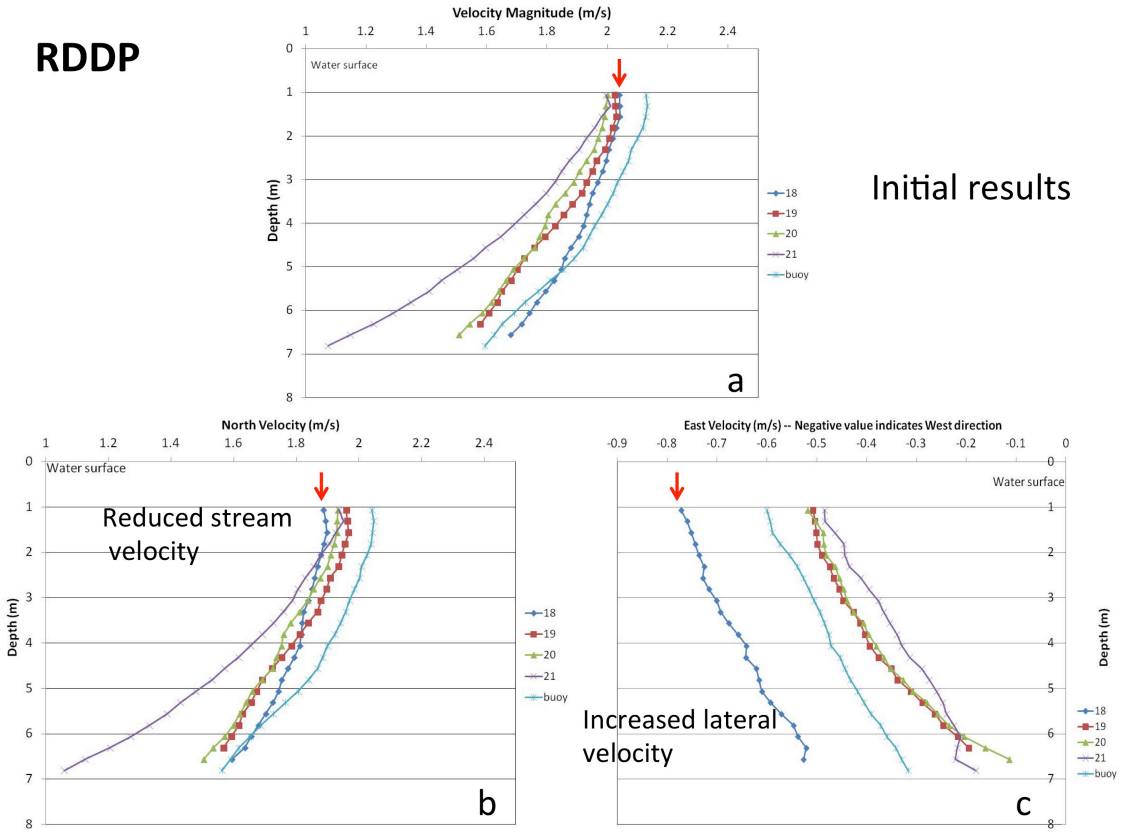

Figure 2. Current velocities at each of the measurement locations shown in Figure 1. Current velocity magnitude (a), North vector current velocity (b), and East vector current velocity.

Planned activities for the next quarter

During the next quarter we will continue analyzing ADCP data to determine the effect of the RDDP on current flow velocities and turbulence and developing conceptual and physical models of RDDP interactions with debris.